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Positive Safety Outcomes of Clear Signal for Action Program at Union Pacific Yard Operations

SUMMARY

Union Pacific Railroad (UP), the Brotherhood of Locomotive Engineers and Trainmen (BLET), and the United Transportation Union (UTU) are collaborating with the Federal Railroad Administration (FRA) Human Factors Research and Development (R&D) Program to conduct a Clear Signal for Action (CSA) demonstration pilot. CSA is a risk reduction process that combines behavior-based safety (BBS), continuous improvement, and safety leadership. The goal of this project is to determine whether CSA can improve safety and safety culture in the railroad industry as it has in other industries. The project involves peer-to-peer observations of yard-crew workers from UP's Livonia Service Unit (LVSU), who provide each other with confidential, constructive coaching feedback to reduce the probability of injuries, derailments, and other incidents. In addition, behavioral observation and interview data, compiled by peers are used to identify systemic factors and implement corrective actions at the systems level to lower the risk of derailments and accidents. Corrective actions to address behavioral issues are also implemented. Training in how to effectively support the process is also provided for managers. With sponsorship from FRA, Behavioral Science Technology (BST), Inc. is instructing and advising in the implementation of the CSA intervention, titled Safety Through Employees Exercising Leadership (STEEL), at LVSU.

In addition to the CSA implementation, FRA is sponsoring a lessons-learned team (LLT) to examine what it takes to implement CSA successfully, the impact of CSA on safety and safety culture, and what factors are needed to sustain CSA in the long term. An early LLT activity involved meeting with project stakeholders to develop a logic model that describes how the CSA method works and what results are expected from it. The LLT will be assessing CSA at LVSU according to a logic model similar to the illustration in Figure 1.

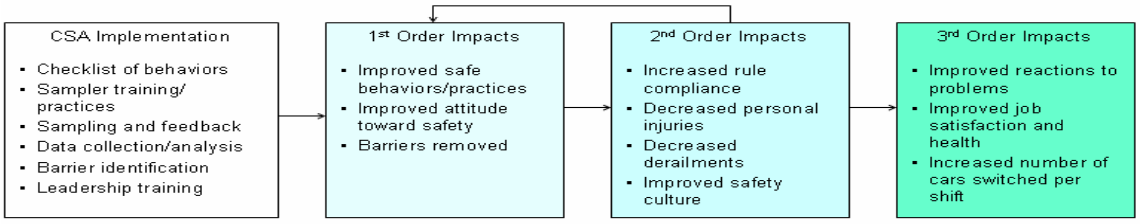

Figure 1. Section of the STEEL logic model with CSA implementation and expected impacts

Data collected thus far indicate that the CSA implementation at LVSU has gotten off to an encouraging start. Outcomes observed include: strong labor and management commitment, 75 identified barriers to safety removed, expansion to other yards, and improved safety communications between management and labor.

Most of the efforts to date have focused on the Avondale terminal. A joint BLET-UTU steering committee developed and validated a checklist of 18 safety practices to be tracked. More than 140 employees have received training on conducting peer-to-peer observation-feedback sessions, and over 2,100 such sessions have taken place. Key managers have also been trained in how to effectively support the CSA process. During interviews and project meetings, Avondale employees indicated that improvements have occurred since the CSA process was implemented. In addition, because of a successful labor-management partnership, the implementation is expanding to other terminals in the service unit.

BACKGROUND

LVSU is the third CSA demonstration pilot and was implemented after the second CSA demonstration pilot at the San Antonio Service Unit (SASU). Like SASU, LVSU involves the operating crafts of locomotive engineers and conductors. However, SASU focused on road crews, whereas LVSU focused on switching crews. The first demonstration pilot was with baggage handlers at Amtrak's Chicago terminal.

A CSA intervention typically requires a steering committee comprising workers (and sometimes management) to execute the CSA method in a particular location. The steering committee develops a site-specific checklist of safe and at-risk behaviors and conditions by identifying common behaviors and conditions contributing to derailments and injuries from past injury reports. Employees then use the checklist to conduct anonymous, peer-to-peer observations and to provide confidential coaching feedback about at-risk behaviors and conditions, encouraging communication about and enhancing personal awareness of safety. The steering committee analyzes the collected data to identify trends due to behavior as well as systemic barriers to safety. The issues due to behaviors are addressed in feedback and/or training, and the systemic barriers to safety are addressed through corrective actions, such as alterations to policies, procedures, facilities, and training. The process is aimed at providing labor and management with current and reliable information on individual and systemic exposure to hazards so that corrective actions can be taken before actual injuries or derailments occur.

FRA is sponsoring this and the other CSA demonstration projects to determine if CSA can improve safety in the railroad industry as it has in other industries. To succeed, these CSA pilots must address the railroad industry's unique culture, regulatory environment, and the structure for noncompliance with railroad rules and Federal Regulations. In the first FRA-sponsored CSA intervention, which involved Amtrak baggage handlers, the number of worker-hours between injuries tended to increase, showing improvement, as the cumulative number of CSA observation-feedback sessions increased. In addition, the monthly injury rate tended to be lower when the monthly observation-feedback rate was greater. Those results suggested that CSA could be effective for railroad baggage handlers; however, CSA had never been tried with switching crews working in yards as is being done in LVSU. By focusing on yard operations at LVSU, this implementation applies CSA to the environment where injuries and derailments have historically been most common.

The CSA intervention in LVSU is (STEEL); Behavioral Science Technology, Inc. (BST), a company that has implemented CSA-like programs in a broad range of industries, is providing consulting services for the project. They have been implementing their Behavioral Accident Prevention Process® (BAPP®) technology since spring 2006 at the Avondale Yard in the LVSU. The LLT, comprising the Volpe National Transportation Systems Center and New Vectors, is evaluating the effectiveness of this intervention for FRA.

METHODS

STEEL Implementation in Avondale Yard

The STEEL implementation at the Avondale Yard started in the spring of 2006. A joint BLET/UTU steering committee developed a checklist of 18 safety practices for yard switching operations to be tracked (see Figure 2 for examples).

4.0 KICKING CARS
4.1 Release Zones
4.2 Alignment of Couplers
4.3 Fouling Tracks
5.0 LINING SWITCHES AND DERAILS
5.1 Checking Switches
6.0 YARD MOVEMENTS
6.1 Protecting Shove Movements
6.2 Spur and Industry Tracks

Figure 2. Examples from the checklist of safety behavior/conditions

Of the 140 transportation employees at the Avondale Yard, more than 110 have been trained in performing peer-to-peer observation-feedback sessions in the last year at both Avondale and Lake Charles, Louisiana Yards. The ultimate goal is to train all 800 or so transportation employees within the service unit. Managers at both locations have also received training in how to support the STEEL process.

Over 1,480 anonymous observation-feedback sessions have taken place to date at both the Avondale and Lake Charles Yards. The pace is expected to accelerate as more people are trained not only at these sites but also at Beaumont, Texas, and other terminals.

Evaluation of the STEEL Project

The methodology for identifying lessons learned has involved four activities. The first activity was the

development of a logic model, which is a pictorial representation of relationships among the implementation process, the immediate outcomes of the implementation process (1st-Order Impacts), and more distant consequences (2nd- and 3rd-Order Impacts) (see Figure 1). The elements and related measures that can be observed early in the implementation are in the box labeled 1st-Order Impacts, while those that will occur later are in the boxes to the right. As shown in Figure 1, implementation of CSA is expected to lead to increased operator attention to operating conditions, which should result in fewer injuries and derailments. This is the primary hoped for outcome–safer employees and a more efficient and effective operation. These impacts in turn would lead to less equipment damage, and more cars switched per shift.

The second lessons-learned activity was a search for measures that would serve as valid indicators for each element of the logic model. For instance, while some indicators, such as the number of derailments, are obvious, others, such as a perception survey to measure safety culture, needs special data to be collected. Sources for the measures in the logic model include data on safety, corrective actions, and the implementation process, as well as safety-culture surveys.

The third lessons-learned activity involved determining how to conduct the analysis. Knowing the number of derailments, for instance, is useful only if changes can be compared over time at LVSU or among LVSU and other UP service units.

The fourth lessons-learned activity involved conducting interviews with managers and workers at LVSU in 2006. Those interviewed described which STEEL activities were occurring and how they would measure STEEL success. Their responses also helped to confirm the validity of the logic model.

These four lessons-learned activities interact with each other, revealing changes that may be needed in other demonstration pilots.

EARLY INDICATION OF SUCCESS

Although it is too early to determine if the program is having its intended long-term impact, the first step in assessing impact is to determine whether the program was implemented correctly and identify early indicators of success. Data collected so far indicate that the implementation is viable and that short-term positive outcomes are occurring. Several indicators suggest that the program is being implemented as planned and positive safety benefits are beginning to accrue:

- Barriers removed. Over 75 barriers to safety that required management support have been removed, many as a result of workers calling the Safety Hotline to report potential problems. Many others that the Steering Committee could remove on their own also have been addressed. Examples include fixing hard to throw switches and employees wearing personal protective equipment more consistently.
- STEEL process expanded to other yards. Building on the success at Avondale, the implementation recently has been expanded to yards at Beaumont and Lake Charles. The first training classes have taken place at Lake Charles, and the first observations have been made.
- *STEEL Newsletter* created. The steering committee publishes a monthly *STEEL. Newsletter* to announce progress, testimonials, and upcoming events.
- Management support. Management has shown strong support by providing time for employees to be trained and make observations, and removing barriers such as providing personal protection equipment and upgrading the facilities.
- Credibility of STEEL facilitators. The STEEL facilitators are respected by management and the steering committee for their ability to perform their work.
- Quality observations and feedback. Ratings for observation-feedback sessions have averaged 4.8 on a 5-point-rating quality scale, with 5 points being the best rating.
- Labor, management, government cooperation. UP management and the steering committee have provided useful data to the LLT to help measure the impact of STEEL on such things as injuries and derailments.

FUTURE ACTIVITIES TO ASSESS OUTCOMES

As data are collected, the impact of STEEL on safety will be assessed using three types of comparisons. First, corrective actions will be tracked to see if they were implemented and if any observed changes could be related to safety. For instance, if many people report issues with the condition of switches, the analyses could determine whether effective corrective actions were taken to improve them. Second, cross-terminal comparisons will be made within LVSU. Finally, comparisons will be made among LVSU and other UP Southern Region service units. In addition to safety, STEEL is

likely to affect safety culture. To test this, a safety culture survey is being deployed to employees at Avondale and at other sites for comparison.

CONCLUSIONS

The CSA implementation at LVSU is on track with short-term positive outcomes. Despite difficult labor-management relations rooted in the history of the rail industry, labor and management are showing commitment to the process and are working for positive improvements to safety. The implementation is on track and expanding, building on a successful partnership between labor and management. As the implementation proceeds in the next year or so, it will become clearer whether CSA will have a discernable impact on safety and whether this risk reduction method can be more broadly applied and sustained in the rail industry.

WANT MORE INFORMATION?

For details about the CSA implementation on the UP San Antonio Service Unit, see *Clear Signal for Action Program Addresses Locomotive Cab Safety Related to Constraining Signals*, February 2007, Research Results RR 07-08.

For findings from another CSA project, see *Behavior-Based Safety at Amtrak-Chicago Associated with Reduced Injuries and Costs*, February 2007, Research Results RR 07-07.

Both papers are available on the FRA Web site (http://www.fra.dot.gov/us/content/1920).

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